

Claims:

1. A tubing injector for injecting coiled tubing into a subsea flowline, comprising:
 - a traction device including opposed grippers laterally moveable with respect to the coiled tubing to move a respective chain link member of an endless loop chain into gripping engagement with the coiled tubing;
 - a drive motor for powering the endless loop chain;
 - a plurality of roller bearings each acting between a respective chain link member and a gripper, each roller bearing including a shaft and seals subjected to subsea conditions; and
 - a pressure compensating device for subjecting fluid in a fluid passageway in the roller bearing to a fluid pressure functionally related to subsea pressure, such that a controlled pressure differential exists across the seals which seal the fluid from the subsea conditions.
2. A tubing injector as defined in Claim 1, wherein the pressure compensating device includes a piston moveable within a bore in the shaft of the roller bearing, with one face of the piston exposed to lubricant and an opposing face of the piston exposed to subsea conditions.
3. A tubing injector as defined in Claim 2, further comprising:
 - a seal for maintaining substantially sealed engagement between the piston and the shaft to fluidly isolate the fluid from the subsea conditions.
4. A tubing injector as defined in Claim 2, further comprising:
 - a biasing member within the shaft for exerting a selected bias on the piston.

5. A tubing injector as defined in Claim 1, wherein the pressure compensating device includes a diaphragm positioned within the shaft for sealing fluid from subsea conditions, such that movement of the diaphragm provides pressure compensation to the fluid.

10 6. A tubing injector as defined in Claim 1, further comprising:
a fluid inlet port in the shaft for selectively inputting fluid into the fluid passageway in the roller bearing assembly; and
a check valve from preventing the fluid from passing outward from the fluid passageway.

15 7. A tubing injector for injecting coiled tubing into a subsea flowline, comprising:

a traction device including opposed grippers laterally moveable with respect to the coiled tubing to move a respective chain link member of an endless loop chain into gripping engagement with the coiled tubing;

20 a drive motor for powering the endless loop chain;

a plurality of roller bearings each acting between a respective chain link member and a gripper, each roller bearing including a shaft and seals subjected to subsea conditions;

25 a fluid inlet port in the shaft for inputting fluid into a fluid passageway in the roller bearing assembly; and

a pressure compensating device for subjecting fluid in the fluid passageway in the roller bearing to a fluid pressure functionally related to subsea pressure, such that a controlled pressure differential exists across the seals which seal the fluid
30 from the subsea conditions.

8. A tubing injector as defined in Claim 7, wherein the pressure compensating device includes a piston moveable within a bore in the shaft of the roller bearing, with one face of the piston exposed to lubricant and an opposing face
35 of the piston exposed to subsea conditions.

9. A tubing injector as defined in Claim 8, further comprising:
a seal for maintaining substantially sealed engagement between the piston
and the shaft to fluidly isolate the fluid from the subsea conditions.

10 10. A tubing injector as defined in Claim 8, further comprising:
a biasing member within the shaft for exerting a selected bias on the piston.

11. A tubing injector as defined in Claim 8, wherein the pressure
compensating device includes a diaphragm positioned within the shaft for sealing
15 fluid from subsea conditions, such that movement of the diaphragm provides
pressure compensation to the fluid.

12. A tubing injector as defined in Claim 1, further comprising:
a check valve from preventing the fluid from passing outward from the fluid
20 passageway.

13. A tubing injector as defined in Claim 1, wherein the tubing injector
injects coiled tubing into a subsea well.

25 14. A method of injecting coiled tubing into a subsea flowline, comprising:
providing a traction device including opposed grippers laterally moveable with
respect to the coiled tubing to move a respective chain link member of an endless
loop chain into gripping engagement with the coiled tubing while powering the
endless loop chain;

30 providing a plurality of roller bearings each acting between a respective chain
link member and a gripper, each roller bearing including a shaft and seals subjected
to subsea conditions; and

automatically pressure compensating fluid in a fluid passageway in the roller bearing to a fluid pressure functionally related to subsea pressure, such that a controlled pressure differential exists across the seals which seal the fluid from the subsea conditions.

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15. A method injector as defined in Claim 14, further comprising:

providing a piston moveable within a bore in the shaft of the roller bearing, with one face of the piston exposed to lubricant and an opposing face of the piston exposed to subsea conditions.

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16. A method as defined in Claim 15, further comprising:

maintaining substantially sealed engagement between the piston and the shaft to fluidly isolate the fluid from the subsea conditions.

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17. A method as defined in Claim 15, further comprising:

exerting a selected bias on the piston.

18. A method as defined in Claim 14, further comprising:

providing a diaphragm positioned within the shaft for sealing fluid from subsea conditions, such that movement of the diaphragm provides pressure compensation to the fluid.

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19. A method as defined in Claim 14, further comprising:

selectively inputting fluid into the fluid passageway in the roller bearing assembly; and

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preventing the fluid from passing outward from the fluid passageway with a check valve.

20. A method as defined in Claim 14, wherein the coiled tubing is injected

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into a subsea well.